Airport Measurements with the Traffic Speed Deflectometer
Measurement overview

• Measured pavements
  • Runway 1
  • Runway 2
  • Runway 3
  • Apron
  • Parking lot
  • Loop around terminal building
Examples from runway 2
SCI300 on runway 2

SCI300 10 m averages, Highlight runway center

2D map of pavement performance
Slope spikes on runway 2

- TSD is able to consistently pick up the same feature.
- Feature is around 80 cm wide. An FWD would never find this.
Slope in 1.5 m on runway 2

High slope band

Low slope band

Related to the subgrade. Probably some geological features at the runway site.
SCI300 at parking lot

- New and old pavements are clearly visible
- New problems might be developing near edge of new pavement

But there is more to see
SCI300 at parking lot

Challenging conditions:
- Designed for airplane loads
- Concrete plates are covered with an asphalt layer

But still we are able to detect the joint movement

Possible due to high accuracy in short reporting intervals
Loop around terminal building

SCI300

3 runs

Very good match
Why not perfect match?
Loop around terminal building

SCI300

Driving paths

Driving speed
Apron

Identify soft section

Identify stiff sections

Concrete joints
Back-calculation on runway 2

- Three layer model with layer thicknesses $h_3 = 25$ cm, $h_2 = 30$ cm, $h_1 = \infty$
Back-calculation on runway 2

$h_3 = 12 \text{ cm}$, $h_2 = 30 \text{ cm}$, $h_1 = 100 \text{ cm}$
Back-calculated horizontal strain
Back-calculated vertical strain
Conclusion

• Measured 350 km of airport pavement
• Demonstrated ability to measure pavement behavior with high repeatability and continuous sampling
• Demonstrated ability to identify highly localized pavement defects and concrete joints
• Demonstrated ability to identify areas with low/high subgrade bearing capacity
• Back-calculated elastic moduli and pavement strains
Questions?